APRIL, 1927

ENTOMOLOGICAL NEWS

Vol. XXXVIII No. 4

JAMES H. B. BLAND,
1833-1911

CONTENTS

Wolcott—Notes on the Pierid Butterfly, Kricogonia castalia Fab. (Lepid.) 97
Montgomery—Notes on Some Louisiana Dragonflies (Odonata) 100
Back Volumes of the News. 105
Weiss—The Entomology of Erasmus Darwin's "Botanic Garden" . . . 106
Weiss—Andrew Crosse' Acarus 111
Hood—Nineteen Synonyms in the North American Thysanoptera. . . . 112
Byers—The Nymph of Libellula incesta and a Key for the Separation of the Known Nymphs of the Genus Libellula (Odonata) 113
Knull—Descriptions of Coleoptera with Notes (Buprestidae and Cerambycidae) 115
Braun—A New Species of Holcocera Predaceous on Mealybugs (Microlepidoptera) 118
Editorial—The Situation of Systematic Entomology 119
Grant—Announcement of an Experiment. 120
Entomological Literature 121
Obituary—Professor Mario Bezzi 128
Obituary—Mrs. Annie Trumbull Slosson. 128

PHILADELPHIA, PA.
THE ACADEMY OF NATURAL SCIENCES,
Logan Square

Entered at the Philadelphia, Pa., Post Office as Second Class Matter.
Acceptance for mailing at the special rate of postage prescribed for in Section 1103
Act of October 3, 1917, authorized January 15, 1921.

ENTOMOLOGICAL NEWS.
ACAD. NAT. SCI.
PHILADELPHIA, PENN'A.

ENTOMOLOGICAL NEWS

published monthly, excepting August and September, by The American Entomological Society.

Philip P. Calvert, Ph.D., Editor; E. T. Cresson, Jr., Associate Editor.

Advisory Committtee: Philip Laurent, J. A. G. Rehn, Chas. Liebeck, J. Chester Bradley, Ph.D., Frank Morton Jones, John C. Lutz, Max Kisliuk, Jr.

The subscription price per year of ten (10) numbers is as follows:

United States and possessions . .	$3.00
Canada, Central and South America .	3.15
Foreign	3.25

Single copies 35 cents

ADVERTISING RATES: Full width of page. Payments in advance.
One issue, 1 in., $ 1.20, 2 in., $ 2.40, half page, $ 4.00, full page,, $ 8.00
Ten issues " 11.00, " 20.00, " 35.00, " 70.00

SUBSCRIPTIONS AND ADVERTISEMENTS. All remittances, and communications regarding subscriptions, non-receipt of the NEWS or of reprints, and requests for sample copies, should be addressed to **Entomological News, 1900 Race St., Philadelphia, Pa.**

All complaints regarding non-receipt of issues of the NEWS should be presented within three months from date of mailing of the issue. After that time the numbers will be furnished only at the regular rate for single copies. Not more than two issues will be replaced gratis, through loss in transit or in change of address, unless such have been registered, at the subscriber's expense.

MANUSCRIPTS. Address all other communications to the editor, Dr. P. P. Calvert, Zoological Laboratory, University of Pennsylvania, Philadelphia, Pa.

TO CONTRIBUTORS. All contributions will be considered and passed upon at our earliest convenience and, as far as may be, will be published according to date of reception. The receipt of all papers will be acknowledged. Proof will be sent to authors when requested. Twenty-five "extras" of an author's contribution, without change in form and without covers, will be given free when they are wanted; if more than twenty-five copies are desired *this should be stated on the MS.*

Owing to increased cost of labor and materials, no illustrations will be published in the NEWS for the present, except where authors furnish the necessary blocks, or pay in advance the cost of making blocks and pay for the cost of printing plates. Information as to the cost will be furnished in each case on application to the Editor. Blocks furnished or paid for by authors will, of course, be returned to authors, after publication, if desired.

STATED MEETINGS

Of The American Entomological Society will be held at 7.30 o'clock P. M., on the fourth Thursday of each month, excepting June, July, August, November and December, and on the third Thursday of November and December.

Communications on observations made in the course of your studies are solicited; also exhibits of any specimens you consider of interest.

The printer of the NEWS will furnish reprints of articles over and above the twenty-five given free at the following rates: One or two pages, twenty-five copies, 35 cents; three or four pages, twenty-five copies, 70 cents; five to eight pages, twenty-five copies, $1.40; nine to twelve pages, twenty-five copies, $2.00; each half-tone plate, twenty-five copies, 30 cents; each plate of line cuts, twenty-five copies, 25 cents; greater numbers of copies will be at the corresponding multiples of these rates.

ENTOMOLOGICAL NEWS

VOL. XXXVIII APRIL, 1927 No. 4

Notes on the Pierid Butterfly, Kricogonia castalia Fab. (Lepid.).

By GEORGE N. WOLCOTT, Port-au-Prince, Hayti.

Records of an unusual abundance of a particular kind of insect are by no means uncommon in entomological literature, and indeed, such occurrences are often of such economic importance as to abundantly warrant the entire time and attention of one member of the U. S. Bureau of Entomology being given to them. In some cases, other features may outweigh the economic interest. The esthetic thrill produced by millions of light-colored butterflies dancing about one can be more readily imagined than described, and the mystery of where they all came from, and where they are going, especially if they seem to be steadily moving in one direction, is not at once susceptible to scientific explanation.

While I was lying sick in bed in Port-au-Prince, Haiti, in April and May, 1926, considerable numbers of yellow Pierid butterflies were to be noted flying past, often as high up as the tops of the royal palms. For minutes at a time, all would seem to be going in the same general direction, then some would be noticed going in the opposite direction. Repeated observations only served to confirm the original impression that despite the business-like (for a butterfly) air with which they were flying, there was no definite direction in which even the majority of them were going. In July and August they were no more noticeably abundant than when first noted, but early in September there was a decided increase in their numbers. By the middle of the month, the peak of abundance had been reached, and a week later very few were to be seen.

The center of maximum abundance appeared to be the more desert portion of the plain of the Cul-de-Sac, especially towards the coast, and by migration, this was extended northward, or north-west, along the coast line for possibly as much as

ENTOMOLOGICAL NEWS.
ACAD. NAT. SCI.
PHILADELPHIA, PENN'A.

thirty or forty miles. The speedier automobiles coming into Port-au-Prince from the north had their radiators entirely covered with the yellow wings of the butterflies. Where shallow ditches on either side of the road thru the desert region held a little water, or fresh horse or burro manure proved attractive, the clouds of startled butterflies that rose up as one passed filled the car, and momentarily hundreds of soft bodies and fluttering wings beat against one's face and arms.

Despite the numberless times individual butterflies stopped to rest and drink, there was no question about the direction of their movement. They were moving steadily northward, or as nearly northward as the steep mountains which form the northern boundary of the plain and to the northwest closely skirt the coast, allowed. Along the coast, some of the butterflies were flying out over the water, but none were observed to be very far out, and many hugged the shore, stopping now and then to sip salty water from wave-moistened stones or driftwood. The highroad and the railroad right of way paralleling the beach, and even the low woods at the foot of the mountains were alive with their northward-impelled bodies.

The vast majority of the butterflies were of a single species, *Kricogonia castalia* Fab., or some variety of this species, altho a comparatively few may have been *Pieris monuste* Linnaeus, which would be practically indistinguishable in flight. Now and then one might see one of the larger and more intensely colored Catopsilias, or a black *Papilio*, or a chestnut *Dione vanillae* Linnaeus, but none of these other species seemed to be more than temporarily imbued with the northward urge of *Kricogonia*.

Of the early stages of *Kricogone lyside*, Holland says, "Nothing has, as yet, been satisfactorily ascertained in relation to these." Such enormous numbers of butterflies having developed in a comparatively restricted desert area must surely have produced a noticeable defoliation of their host plant or plants. Desert vegetation in the Cul-de Sac appears to consist largely of cactus and dwarfed leguminous trees. The cactus was obviously untouched by caterpillars. As the caterpillars of the

ENTOMOLOGICAL NEWS
ACAD. NAT. SCI.
PHILADELPHIA, PENNA.

allied genus, *Catopsilia,* feed on the leaves of various legumes, a careful inspection was made of the foliage of such trees and shrubs, but no indication of caterpillar injury was noted.

Amid the grey or bluish-green and feathery leaves of the common desert vegetation, the dense dark green foliage of lignum vitae, *Guajacum officinale,* is as distinctive and striking as is its trunk, mottled and blotched like that of the buttonball. The rounded oval of its leaves had often before been noted as notched by the feeding of the little Otiorhynchid beetles, *Artipus psittacinus* Gyllenhal (determination by Dr. Guy A. K. Marshall). These beetles are covered with light green scales above and silvery white ones beneath, and are so conspicuous against the dark green lignum vitae leaves that they were credited with being responsible for all leaf injuries whatsoever that might appear on this plant. My six-year-old daughter, however, conducting an independent investigation of her own, noted that the trunk of one of the lignum vitae trees was alive with a multitude of wandering caterpillars and these, on being reared to adults, proved to be *Kricogonia castalia* Fab., as determined by Dr. Wm. Schaus, of the United States National Museum.

The fully grown last instar larva is about three-fourths of an inch long and one-eighth inch wide, cylindrical, of substantially uniform diameter, with a skin somewhat roughened and pubescent. The oval head is of nearly the same diameter as the body, dull green in color, with numerous irregularly-shaped lighter spots on the dorsal half, the ocelli and the bases of some of the hairs being black. On the body, the prominent but narrow silvery or grey mid-dorsal stripe is laterally broadly bordered with chocolate brown. At the sides, this breaks up into numerous spots on a golden yellow background, which midway to the silvery lateral stripes become so numerous as to form a continuous stripe, sharply limited ventrally by the golden yellow background. The lateral silvery stripes are narrowly above and scarcely at all below, margined with brown. Below, posteriorly, and at the sutures, the body is dull green like the head, but somewhat lighter around the prolegs. The claws of the prolegs are brown; those of the true legs are semi-transparent green.

The chrysalis is bluish grey in color, with whitish bloom,

smooth but not shining, wing pads prominent and rather sharply depressed posteriorly to meet the small abdomen. The pupal period was six days.

From the chrysalids of other larger butterflies collected at the same time in this region, black parasitic wasps, *Chalcis incerta* Cresson, were reared, but none of those of *Kricogonia* were thus parasitized. From each of several of the larvae, however, two *Apanteles* larvae emerged and spun cocoons. The imagos were determined by Mr. A. B. Gahan, of the United States National Museum, as *A. cassianus* Riley.

Notes on some Louisiana Dragonflies (Odonata).

By B. Elwood Montgomery, Poseyville, Indiana.

From June 15 to August 16, 1925, while working at the Tallulah, Louisiana, laboratory of the Bureau of Entomology, I made use of my spare time to study and collect dragonflies. Only holidays and brief periods in the late afternoon could be given to this work. The number of points which could be visited on such occasions was limited but fairly represented the local habitats. The elevation of Tallulah, which is probably representative of the entire district in which collecting was done, is 91 feet. Five hundred and ninety-six specimens, representing twenty-eight species were taken.

I am indebted to Mr. E. B. Williamson, of Bluffton, Indiana, for the identification of a few species and for checking my determinations of other species. Several members of the Tallulah staff assisted in collecting specimens.

Eagle Lake, an old bayou channel about four miles west of Tallulah, was visited more frequently than any other locality. This body of water is about a mile long and has a maximum width of about 250 yards. Collecting was done at only one end of the lake where the water was comparatively shallow. Here the banks were wooded and rather free from low vegetation. *Tramea* and *Pantala* were usually to be found soaring over a nearby field grown up to a uniform height of about four feet with weeds. *Argia apicalis* was frequent in the paths among the trees near the lake. *Pachydiplax longipennis* was

abundant about a small area of water smart weed. *Enallagma signatum, Perithemis domitia* and *Libellula incesta* flew along the shore. *Epicordulia princeps* was frequently seen.

Bear Lake, about six miles northwest of Eagle Lake resembles the latter, both in its general character and its dragonfly fauna.

Alligator Bayou, seven miles southwest of Tallulah, was visited at a point where the bayou spreads out into a broad pond grown up with *Nelumbo*. The banks were grass-covered and partly shaded by trees. *Enallagma geminatum, E. signatum, Ischnura posita, Nasiaeschna pentacantha, Perithemis domitia* and *Pachydiplax longipennis* were captured here.

Lake Bruin, which was visited on July 26 and August 8, is an old ox-bow cut-off about sixteen miles long in Tensas Parish, abouty forty miles south of Tallulah. Collecting was done near the west end, where a sand beach extends from a few feet to several yards back from the water. *Celithemis eponina* was found on both dates, alighting on the branch tips of cypress trees growing in the water or on lower vegetation back of the beach. *Epicordulia princeps, Tramea lacerata* and *Brachymesia gravida* flew over the water. *Perithemis domitia* and *Enallagma signatum* were found in numbers at the water margin and the former less frequently in the vegetation back from the beach where *Erythemis simplicicollis* was common. *Argia apicalis, Enallagma civile, E. geminatum, Ischnura posita, I. ramburii, Anomalagrion hastatum* and *Plathemis lydia* were also taken in this vegetation.

Collecting was done frequently at Bayou Roundaway, three miles south of Tallulah. The water was only a few inches deep and the channel, six to ten feet wide, was filled with a growth of low water vegetation. *Enallagma signatum* and *Ischnura posita* were common; *Libellula incesta* was frequently seen; and a few individuals of *Libellula vibrans* were present. A *Hetaerina* was once seen here but was not taken.

Bayou Macon, seventeen miles west of Tallulah, was visited on August 9 and 15. The water flows with a quite noticeable current in this bayou. The channel is about fifty feet wide and

the maximum depth was six to ten feet when I visited it. Collecting here was difficult as the banks were steep and the few islands supporting a growth of vegetation could not be reached. The water was very clear and fish could be easily seen swimming about at all depths. The banks were wooded and free from all herbaceous growth. *Erythemis simplicicollis* was common in open areas near the bayou. Three species of *Argia, apicalis, sedula* and *tibialis* were taken from the bare ground among the trees. Along the margin of the bayou *Hetaerina titia, Enallagma signatum, Ischnura posita, I. ramburii* and *Anomalagrion hastatum* were found. *Macromia taeniolata* patrolled the stream; *Tramea* and *Pantala* were seen soaring over the water but none were taken.

Alligator Lakes were visted on one day only. These are a series of three ponds in the bed of an old bayou in the deep woods about seven to eight miles southwest of Tallulah. The water is shallow and over the muddy banks logs and fallen trees are thickly scattered. Dragonflies were not abundant but a few *Macromiae* were seen and one specimen each of *Argia apicalis, Ischnura posita, I. ramburii, Pachydiplax longipennis* and four each of *Libellula incesta* and *Perithemis domitia* were taken.

List of Species.

1. HETAERINA TITIA Drury. Bayou Macon, August 9 and 15, all tenerals.

2. ARGIA APICALIS Say. Eagle Lake, June 20; July 4; August 12. Bear Lake, July 11 and 18. Lake Bruin, July 26; August 8. Bayou Macon, August 15. Alligator Lakes, August 16. Common at first three localities, exceeded in number by both the following species of the genus at Bayou Macon. At Alligator Lakes a male of this species was the only *Argia* seen.

3. ARGIA SEDULA Hagen. Bayou Macon, August 9 and 15. Seven males and one female taken on each day.

4. ARGIA TIBIALIS Rambur. Eagle Lake, July 1. Bear Lake, July 18. Bayou Macon, August 9 and 15.

5. ENALLAGMA CIVILE Hagen. Bayou five miles east of Tallulah, July 23. Lake Bruin, July 26; August 8.

6. ENALLAGMA EXSULANS Hagen. A male from Bear Lake, July 11.

7. ENALLAGMA GEMINATUM Kellicott. A male from Alligator Bayou, June 20. Nine males from Lake Bruin, July 26.

8. ENALLAGMA SIGNATUM Hagen. Eagle Lake, June 20 and 29; July 4 and 11; August 12. Alligator Bayou, June 20 and 21. Bayou Roundaway, June 27. Bear Lake, July 11. Lake Bruin, July 26; August 8. Bayou Macon, August 9. Everywhere common.

9. ISCHNURA POSITA Hagen. Alligator Bayou, June 20 and 21. Eagle Lake, June 20; July 4; August 12. Bayou Roundaway, June 27; July 2 and 30. Bear Lake, July 11 and 18. Lake Bruin, July 26; August 8. Bayou Macon, August 9 and 15. Alligator Lakes, August 16. Everywhere common. Twice as many specimens of this species as of any other were taken.

10. ISCHNURA RAMBURII Selys. Lake Bruin, July 26; August 8. Bayou Macon, August 9 and 15. Alligator Lakes, August 16. Both yellow and green females were taken.

11. ANOMALAGRION HASTATUM Say. Eagle Lake, July 4. Lake Bruin, July 26. Insect grounds, July 31. Bayou Macon, August 15. Only one specimen was secured from each locality; the Lake Bruin specimen was a female, the others males. The male from the insectary grounds was taken during a rain, while flying actively about from one stalk of grass to another.

12. GOMPHUS SP. Individuals of this genus were seen several times at Eagle Lake, alighting on stumps and sticks protruding above the water but flying at the approach of the boat. A teneral female, apparently belonging to the *pallidus* group, was taken June 20.

13. ANAX JUNIUS Drury. Seen many times at various localities during the summer. A male was taken at the insectary grounds July 27.

14. NASIAESCHNA PENTACANTHA Rambur. A male from Alligator Bayou, June 21 and a female from Bear Lake, July 11.

15. MACROMIA TAENIOLATA Rambur. Bear Lake, July 11. Bayou Macon, August 9 and 11. Four males were taken.

16. EPICORDULIA PRINCEPS Hagen. Eagle Lake, June 29; July 4 and 18; August 11 and 12. A male and female flying tandem along the edge of the water were taken on the first date.

17. LIBELLULA INCESTA Hagen. Eagle Lake, July 4 and 11. Bear Lake, July 11 and 18. Bayou Macon, August 15. Alligator Lakes, August 16. On one occasion at Bayou Roundaway, where several individuals of this species were patrolling the bayou channel, they were noted to visit the flowers of a plant about three feet high which was common along the bayou. The action seemed intentional as the dragonflies hovered for a moment just above the conspicuous yellow flower then flew to the next where the action would be repeated. I examined the flowers and found many small insects on them but I was not able to approach close enough to a dragonfly to determine if it was catching these.

18. LIBELLULA VIBRANS Fabricius. Bayou near Tallulah, July 25. In the margin of woods at roadside near Tallulah, August 14.

19. PLATHEMIS LYDIA Drury. Eagle Lake, July 4 and 18; August 12. Bayou seven miles southeast of Tallulah, July 25. Lake Bruin, July 26; August 8.

20. PERITHEMIS DOMITIA Drury. Alligator Bayou, June 20 and 21. Eagle Lake, June 20 and 29; July 4, 11, and 18; August 12. Bayou Roundaway, June 27; July 2 and 25. Bear Lake, July 18. Lake Bruin, July 26; August 28. Alligator Lakes, August 16.

21. ERYTHEMIS SIMPLICICOLLIS Say. Eagle Lake, June 20; July 4 and 11; August 12. Bayou Roundaway, June 27; July 30. Bear Lake, July 11 and 18. Lake Bruin, July 26; August 8. Bayou Macon, August 9 and 15. While following an individual of this species at Bayou Roundaway, July 30, I saw it struck from above and carried away into a cotton field by a robber fly. At Bayou Macon, August 9, a male of this species was captured in flight by a female of the Asilid, *Erax interruptus* Macq. (determined by Prof. J. S. Hine), which carried its prey to a bare spot on the ground several feet away where

both were captured. The dragonfly was still alive when taken from the net altho some of the contents of its thorax had been removed by the Asilid. A male of *simplicicollis*, taken at Bayou Roundaway, July 30, was eating a moth. A female taken at Eagle Lake, July 11, was resting on a stick eating another dragonfly, *Perithemis domitia*.

22. PACHYDIPLAX LONGIPENNIS Burmeister. Eagle Lake, June 20; July 4. Alligator Bayou, June 21. Bayou Roundaway, June 27. Bear Lake, July 18. Lake Bruin, July 26. Bayou Macon, August 15. Alligator Lakes, August 16.

23. CELITHEMIS EPONINA Drury. Lake Bruin, July 26; August 8.

24. BRACHYMESIA GRAVIDA Calvert. Lake Bruin, August 8. Several individuals of this species were seen patrolling the shores or resting on tips of sticks extending some distance from the surface of the water; a male was taken.

25. PANTALA FLAVESCENS Fabricius. Cotton field, seven miles northeast of Tallulah, July 7. Insectary grounds, July 7 and 27. Bayou seven miles southeast of Tallulah, July 25. Eagle Lake, August 12.

26. PANTALA HYMENAEA Say. Insectary grounds, July 20.

27. TRAMEA LACERATA Hagen. Cotton field seven miles northeast of Tallulah, July 9 and 17. Insectary grounds, July 20. Bayou seven miles southeast of Tallulah, July 25. Lake Bruin, July 26; August 8. Lawn in Tallulah, July 28. Eagle Lake, August 12.

28. TRAMEA ONUSTA Hagen. Cotton field seven miles northeast of Tallulah, undated. Insectary grounds, July 20. Air field, three miles east of Tallulah, August 1.

Back Volumes of the News.

The late Mr. J. C. Huguenin of San Francisco, a long-time subscriber to the NEWS, left some home-bound volumes of this journal from 1917 to the end of 1926. Mrs. Huguenin will be glad to receive offers for them. Such should be addressed to Mr. R. F. Sternitzky, 201 Charter Oak Ave., San Francisco, California.

The Entomology of Erasmus Darwin's "Botanic Garden."

By HARRY B. WEISS, New Brunswick, New Jersey.

Erasmus Darwin, M.D., grandfather of Charles Darwin, had his carriage equipped for reading and writing, and composed much of his poetry while visiting patients. Among other things, he wrote "The Botanic Garden," a lengthy didactic poem, which, according to L. Rice-Oxley, "taught nothing and was not poetical." This work, published in London, 1791, consists of two parts, part one being entitled "The Economy of Vegetation" and treating of plant physiology, and part two, "The Loves of the Plants," dealing with plant sex. Part two had been published previously and anonymously at Lichfield in 1789. Both poems are accompanied by a galaxy of "philosophical notes" on heat, clouds, electricity, frost, iron, clay, comets, the steam engine, etc., and although the entire work is mainly of historical interest to botanists, the parts of the notes that refer to insects are reproduced because of their quaintness.

Of luminous insects, Doctor Darwin wrote as follows:

"There are eighteen species of Lampyris or glow-worm, according to Linneus, some of which are found in almost every part of the world. In many of the species the females have no wings, and are supposed to be discovered by the winged males by their shining in the night. They become much more lucid when they put themselves in motion, which would seem to indicate that their light is owing to their respiration; in which process it is probable phosphoric acid is produced by the combination of vital air with some part of the blood, and that light is given out through their transparent bodies by this slow internal combustion.

"There is a fire-fly of the beetle-kind described in the Dict. Raisonné under the name of Acudia, which is said to be two inches long, and inhabits the West Indies and South America; the natives use them instead of candles, putting from one to three of them under a glass. Madam Merian says, that at Surinam the light of this fly is so great, that she saw sufficiently well by one of them to paint and finish one of the figures of

them in her work on insects. The largest and oldest of them are said to become four inches long, and to shine like a shooting star as they fly, and are thence called Lantern-bearers. The use of this light to the insect itself seems to be that it may not fly against objects in the night; by which contrivance these insects are enabled to procure their sustenance either by night or day, as their wants may require, or their numerous enemies permit them; whereas some of our beetles have eyes adapted only to the night, and if they happen to come abroad too soon in the evening are so dazzled that they fly against every thing in their way."

On the subject "vegetable glandulation," he states that "The odoriferous essential oils of several flowers seem to have been designed for their defence against the depredations of insects, while their beautiful colours were a necessary consequence of the size of the particles of their blood, or of the tenuity of the exterior membrane of the petal," and tells of a philosopher "who, contemplating this subject thinks it not impossible, that the first insects were the anthers or stigmas of flowers; which had by some means loosed themselves from their parent plant, like the male flowers of Vallisneria; and that many other insects have gradually in long process of time been formed from these; some acquiring wings, others fins, and others claws, from their ceaseless efforts to procure their food, or to secure themselves from injury. He contends, that none of these changes are more incomprehensible than the transformation of tadpoles into frogs, and caterpillars into butterflies."

Concerning the Diptera, he says—"There is a curious circumstance belonging to the class of insects which have two wings, or diptera, analogous to the rudiments of stamens above described: viz. two little knobs are found placed each on a stalk or peduncle, generally under a little arched scale; which appear to be rudiments of hinder wings; and are called by Linneus, halteres, or poisers, a term of his introduction. A. T. Bladh. Amæn. Acad. V. 7. Other animals have marks of having in a long process of time undergone changes in some parts of their bodies, which may have been effected to accommodate them to new ways of procuring their food." Darwin,

from his writings, believed in the theory of evolution as afterwards expounded by Lamarck.

On the subject of insectivorous plants, he writes—"the viscous material which surrounds the stalks under the flowers of" the Catchfly *(Silene)* "is a curious contrivance to prevent various insects from plundering the honey or devouring the seed." "In the Dionæa Muscipula there is a still more wonderful contrivance to prevent the depredations of insects: The leaves are armed with long teeth, like the antennæ of insects, and lie spread upon the ground round the stem; and are so irritable, that when an insect creeps upon them, they fold up, and crush or pierce it to death. The last professor Linneus, in his Supplementum Plantarum, gives the following account of the Arum Muscivorum. The flower has the smell of carrion; by which the flies are invited to lay their eggs in the chamber of the flower, but in vain endeavour to escape, being prevented by the hairs pointing inwards; and thus perish in the flower, whence its name of fly-eater. In the Dypsacus is another contrivance for this purpose, a basin of water is placed round each joint of the stem." Of the Sun-dew, "The leaves of this marsh-plant are purple, and have a fringe very unlike other vegetable productions. And, which is curious, at the point of every thread of this erect fringe stands a pellucid drop of mucilage, resembling a ducal coronet. This mucus is a secretion from certain glands, and like the viscous material round the flower-stalks of Silene (catchfly) prevents small insects from infesting the leaves. As the ear-wax in animals seems to be in part designed to prevent fleas and other insects from getting into their ears. Mr. Wheatly, an eminent surgeon in Cateaton street, London, observed these leaves to bend upwards, when an insect settled on them, like the leaves of the muscipula veneris, and pointing all their globules of mucus to the centre, that they completely intangled and destroyed it. M. Broussonet, in the Mem. de l'Acad. des Sciences for the year 1784, p. 615, after having described the motion of the Dionæa, adds, that a similar appearance has been observed in the leaves of two species of Drosera."

On nectar and nectaries he says in part that "Many insects

are provided with a long and pliant proboscis for the purpose of acquiring this grateful food, as a variety of bees, moths, and butterflies: but the Sphinx Convolvuli, or unicorn moth, is furnished with the most remarkable proboscis in this climate. It carries it rolled up in concentric circles under its chin, and occasionally extends it to above three inches in length. This trunk consists of joints and muscles, and seems to have more versatile movements than the trunk of an elephant; and near its termination is split into two capillary tubes. The excellence of this contrivance for robbing the flowers of their honey, keeps this beautiful insect fat and bulky; though it flies only in the evening, when the flowers have closed their petals, and are thence more difficult of access; and at the same time the brilliant colours of the moth contribute to its safety, by making it mistaken by the late sleeping birds for the flower it rests on.

"Besides these there is a curious contrivance attending the Ophrys, commonly called the Bee-orchis, and the Fly-orchis, with some kinds of the Delphinium, called Bee-larkspurs, to preserve their honey; in these the nectary and petals resemble in form and colour the insects, which plunder them: and thus it may be supposed, they often escape these hourly robbers, by having the appearance of being pre-occupied."

The wax of the candle-berry Myrtle was attributed to insects. "The buds of the Myrica Gale possess an agreeable aromatic fragrance, and might be worth attending to as an article of the Materia Medica. Mr. Sparman suspects, that the green wax-like substance, with which at certain times of the year the berries of the Myrica cerifera, or candle-berry Myrtle, are covered, are deposited there by insects."

On the resemblance of some seeds to insects he has the following to say: "There is another plant, Medicago polymorpha, which may be said to assume a great variety of shapes; as the seed-vessels resemble sometimes snail-horns, at other times caterpillars with or without long hair upon them; by which means it is probable they sometimes elude the depredations of those insects. The seeds of Calendula, Marygold, bend up like a hairy caterpillar, with their prickles bristling outwards,

and may thus deter some birds or insects from preying upon them."

Upon the appearance of his "Botanic Garden," Darwin gained quite a favorable but ephemeral reputation. Apparently he was a much better physician and botanist than poet. Educated at Cambridge and Edinburgh, he began the practice of medicine at Nottingham in 1756. Because of his small number of patients he moved to Lichfield a year later, and here his practice grew and he met many distinguished people. In 1766 while botanising he accidentally met Rousseau at Wootton Hall, afterwards corresponding with him. It is said that he met Samuel Johnson once or twice and that their dislike was mutual. Although of a large build, he was quite energetic, both physically and mentally. By his first wife he had three sons, one of them, Robert Waring, being the father of Charles Darwin, and by his second, four sons and three daughters. Although he was kind to patients and servants and charitable to the poor, at times he was quite magisterial and ill-tempered to his children.

Darwin's poetry was patterned after that of Pope, whose style was passing out of favor. In three prose interludes inserted between the cantos of his "Loves of the Plants," he expounds his views on poetry and states that "the principal part of the language of poetry consists of those words, which are expressive of the ideas, which we originally receive by the organ of sight; and in this it nearly indeed resembles painting."

A clever parody on Darwin's "Loves of the Plants" appeared in the April 16, 1798, and succeeding numbers of the "Anti-Jacobin, or Weekly Examiner," a publication which supported Pitt's Government in the struggle against France and its Revolution.

Darwin's political tendencies were liberal: he favored the Revolution and corresponded with Rousseau. And so the parody served the double purpose of attacking the Jacobins while apparently being directed against Darwin's poor poetry. It was styled "The Loves of the Triangles, a Mathematical and Philosophical Poem," inscribed to Dr. Darwin and written by Ellis, Canning and Frere. As the purpose of the "Botanic

Garden" was "to enlist imagination under the banner of Science," the purpose of the "Loves of the Triangles" was to "enlist the Imagination under the banners of Geometry." Darwin was said to have admired the parody, which now serves to keep alive his otherwise forgotten "Loves of the Plants."

Andrew Crosse's Acarus.

Andrew Crosse, who dabbled in chemistry and electricity in his country home, Fyne Court, six miles from Taunton, made a discovery in 1837 that netted him considerable publicity. In an effort to manufacture crystals of silica, he mixed two ounces of powdered flint with six ounces of carbonate of potash, fused them in a strong heat, reduced the material to a powder and dissolved it in boiling water thereby obtaining potassium silicate. A part of this he placed in boiling water slowly adding hydrochloric acid to supersaturation. This fluid he subjected to continuous electric action through the intervention of a porous stone.

Failing to obtain the crystals of silica, he noted however on the 14th day after the beginning of the experiment, a "few small whitish excrescences projecting from the middle of the porous stone." On the 18th day, the projections were larger and terminated in seven or eight filaments. On the 26th day they took the form of perfect insects "standing erect on a few bristles which were their tails." On the 28th day they moved their legs, later detaching themselves from the stone and moving about. At the end of several weeks about 100 were present, some smaller ones with six legs and larger ones with eight. They were identified as belonging to the genus *Acarus* and called *Acarus crossii.*

Mr. Crosse at first was of the opinion that they had developed from eggs in the water. He repeated the experiment and the acari duly reappeared. Others tried it with similar results. Some believed that it was proof of spontaneous generation. Others asserted the impossibility of such a happening and heaped abuse on Mr. Crosse. Mr. Crosse himself maintained no hypothesis and discreetly said that he did so and so and so was the result. Although it has nothing to do with the *Acarus,* Mr. Crosse was twice married and died on July 6, 1855, in "the room in which seventy-one years before, he had been born." All of which is set forth in volume two of Chamber's "Book of Days," published originally in London, 1862-64.—HARRY B. WEISS, New Brunswick, New Jersey.

Nineteen Synonyms in the North American Thysanoptera.*

By J. Douglas Hood, University of Rochester.

Through the kindness of Mr. J. R. Watson and the authorities at the U. S. National Museum it has been made possible for the writer to examine the types of a number of the Thysanoptera described recently from North America and to point out the synonymy given below. An exclamation mark (!) following a specific name indicates that at least one paratype of that species has been examined in the preparation of this paper; two such marks (!!) mean that the holotype itself has been studied.

Chirothrips floridensis var. *catchingsi* Watson ! = *C. mexicanus* Crawford !!

Scirtothrips owreyi Watson ! = *Frankliniella fusca* (Hinds), the Tobacco Thrips.

Dictyothrips floridensis Watson ! = *Echinothrips americanus* Morgan !

Haplothrips rabuni Watson ! = *H. graminis* Hood !!

Haplothrips querci Watson ! = *H. graminis* Hood !!

Haplothrips cassiae Watson ! = *Leptothrips mali* (Fitch)**.

Haplothrips harnedi Watson ! = *H.* (s. l.) *flavipes* (Jones) !!

Haplothrips oneco Watson ! = *H.* (s. l.) *flavipes* (Jones) ! !

Karynia (sic !) *weigeli* Watson = *H.* (s. l.) *flavipes* (Jones) ! !

Anthothrips dozieri Watson ! = *Haplothrips g o w d e y i* (Franklin) !

Zygothrips wyomingensis Watson ! = *Haplothrips leucanthemi* (Schrank).

Hindsiana cocois Watson ! = *Haplothrips* (s. l.) *melaleuca* (Bagnall).

Cryptothrips adirondacks Watson ! = *Leptothrips mali* (Fitch) [typical] + *Liothrips citricornis* Hood !!

Cryptothrips pini Watson ! = *Leptothrips mali* (Fitch)**.

*Contribution from the Entomological Laboratory of Cornell University.

* *Floridan examples of this species are not quite typical, and the study of further material may show that they represent a valid subspecies. For this form Mr. Watson has furnished three names in as many different genera, namely, *Leptothrips aspersus macro-ocellatus*, 1913, *Haplothrips cassiae*, 1915, and *Cryptothrips pini*, 1915. The first has priority, and would take precedence, of course.

Trichothrips salicis Watson !! = *Cryptothrips rectangularis* Hood !!
Phloeothrips floridensis Watson ! = *Hoplandrothrips jennei* (Jones) ! !
Trichothrips drakei Watson ! = *Hoplothrips karnyi major* (Hood) ! !
Neoeurhynchothrips Watson = *Trichothrips* Uzel.
Idolothrips fuscus Watson !! = *Magalothrips spinosus* Hood !!

The Nymph of Libellula incesta and a Key for the Separation of the known Nymphs of the Genus Libellula (Odonata).

By C. Francis Byers, Cornell University.

While working over the Odonata collection at Cornell University, the writer turned up a reared specimen and exuvia of *Libellula incesta*. The material bore the following label, "Spring Creek, Decatur Co., Ga. Emerged June 13, 1911. Coll. J. C. Bradley." The nymph of *Libellula incesta* has never been described, so on the basis of the above specimen the following description was made.

Libellula incesta Hagen. Nymph. Sex male. Total length 21 mm. Length of abdomen 11.5 mm. Hind femora 6 mm. Width of abdomen 6.5 mm. Lateral setae 5. Mental setae 9, the first five, from the side, long and close together, the fourth being the longest, the remaining four small and further apart. Median lobe decidedly pointed. Movable hooks long, straight and comparatively slender. Setae on the distal margin of the lateral lobes arranged in tufts of three for the most part.

The ninth abdominal segment as long on the ventral side as nine plus ten on the dorsal side. Dorsal hooks on abdominal segments 4-8 long and straight. Lateral hooks on abdominal segments 8 and 9 incurvate and sharp. Lateral abdominal appendages one-half the length of the inferiors.

The nymph of *L. incesta* closely resembles those of *L. axillena* and *L. auripennis*. The following key to the nymphs of *Libellula* of North America will help to separate it from these other species. In this key the genus *Libellula* is considered as consisting of *Ladona* and *Plathemis* as well as *Libellula* proper.

Key for the Separation of the Known Nymphs of the Genus Libellula.

1—Mental setae 0-3. The 10th abdominal segment well exposed. Appendages long and sharp, longer than the dorsum of 8 plus 9. (Ladona).....(2).

—Mental setae 8-13. The 10th abdominal segment partially contained within the 9th. Abdominal appendages short and stout, shorter than the dorsum of 8 plus 9 in most cases. .....(3).

2—Mental setae 3 on each side. .....*exusta* (syn. *julia*)*

—Mental setae wanting. .....*deplanata.*

3—Front border of the median lobe of the labium crenulate. Head widest behind the eyes. (Plathemis). .....*lydia.*

—Front border of the median lobe of the labium not crenulate. Head narrowed behind the eyes. (Libellula, sens. st.). .....(4).

4—Dorsal hooks on abdominal segments 7 and 8 long and sharp, about one-third of the length of the segments that bear them, and much longer than the surrounding hairs, if any. .....(5)

—Dorsal hooks normally present on abdominal segments 3-8, those on 7 and 8 rudimentary and hidden among scurfy hairs, or wanting. .....(8).

—No dorsal hooks present on any of the abdominal segments. .....*saturata.*

5—Lateral setae 5. .....(6).

—Lateral setae 6, mental 8. .....*cyanea.*

—Lateral setae 7, mental 10-11 .....*luctuosa.*

—Lateral setae 8, mental 12-13. .....*flavida?*

6—Mental setae 12-13. Lateral spines of abdominal segments 8 and 9 nearly straight. A black band on the head between the eyes. .....*axillena?*

—Mental setae 8-10. Lateral spines more incurvate. No black band on head. .....(7).

7—Segment 9 on the ventral side equal in length to segments 9 and 10 on the dorsal side. Setae on the distal margin of the lateral lobes of the labium arranged in groups of three. Lateral spines distinctly incurvate. .....*incesta.*

—Segment 9 on the ventral side distinctly longer than 9 and 10 on the dorsal side. Setae on the distal margin of the lateral lobes normally arranged in groups of five. Lateral spines less incurvate.....*auripennis.*

*In spite of the arguments pro and con regarding the true status of the three forms of the old genus Ladona, much is still desired regarding this matter. For the present I have considered *deplanata* as a valid species and *julia* as a synonym of *exusta.*

8—Lateral setae 6, mental 8. .....*forensis.*
—Lateral setae 7, mental 13. .....*quadrimaculata.*
—Lateral setae 8-9, mental 12-13. .....*pulchella.*
Unknown—*comanche, composita, jesscana, nodistica, subornata, semifasciata, vibrans.*

All the nymphs in the above key have been described by Dr. James G. Needham, excepting *L. incesta.* References to the original literature are to be found in R. A. Muttkowski's *Catalogue of the Odonata of North America.*

Descriptions of Coleoptera with Notes (Buprestidae and Cerambycidae).

By J. N. KNULL, Pennsylvania Bureau of Plant Industry.

BUPRESTIS STRIATA Fab. was found breeding and emerging from a hewn pine log which had been in an old log house in Clark's Valley, Pennsylvania. This indicates that seasoned lumber without bark is subject to infestation by this species.

CHRYSOBOTHRIS CHRYSOELA Ill. was found breeding in dead branches of bald cypress *(Taxodium distichum)* at Cape Henry, Virginia. A living pupa, which later transformed to an adult, was found in the sapwood on September 30th.

ACTENODES ARIZONICA n.sp.—Form and size of *A. mendax* Horn, and undoubtedly confused with it in collections, color greenish bronze. Head densely punctuate on vertex, becoming rugose on front, median line on vertex, clypeus truncate with obtuse tooth at middle, eyes prominent, separated on vertex by less than half their width at widest point.

Thorax twice as wide as long, narrower at apex than at base, sides sinuate posteriorly, disk convex, slight subbasal transverse impression, hind angles carinate, surface densely punctuate, punctures becoming more numerous laterally. Elytra wider than thorax, sides parallel to back of middle, then obtusely rounded, apices acute, side margin serrulate, surface scabrose, with a tendency to form transverse strigae. Beneath more shining than above, abdomen reticulate, last ventral truncate in female. Length 16 mm., width 6 mm.

Type a female labeled Tucson, Arizona, August 28, in the author's collection.

Superficially this species resembles *A. mendax* Horn, but the distance between the eyes on the vertex is much narrower, clypeal tooth well developed and elytral and thoracic sculpture is much coarser.

From *A. calcarata* Chev., which it resembles structurally, it can be separated by the lack of the two transverse metallic bands on the elytra, no prominent costae, and the coarser dorsal punctuation.

According to Schaeffer's key* the species would come after *A. calcarata* Chev.

ROMALEUM CORTIPHAGUS Craighead—The larva of this species was described by Dr. Craighead† and the above name suggested by him. In view of the fact that the author has reared a number of adults of this interesting species, it might be advisable to give a brief description of the insect.

Resembling *R. atomarium* Drury, although smaller and elytra more convex, brunneus, clothed throughout with irregular patches of cinereous pubescence. Antennae when laid back over dorsal surface, reaching considerably beyond the tips of the elytra in the male, and extending only slightly beyond in the female.

Thorax more globular than *atomarium*, disk with similarly placed callosities, irregularly densly punctured, punctures becoming larger laterally; coarser on female. Elytra with sides parallel, suddenly rounded at apex; apices truncate, bispinose, surface sparsely punctuate, becoming less numerous toward apex. Last ventral of male not as broadly rounded as in *atomarium*, last ventral of female rounded with at most only slight emargination; in female *atomarium* emargination is much deeper. Length 16 to 20 mm.; width 4.5 to 6 mm.

Description made from a male in author's collection, reared July 4 from the bark of chestnut oak *(Quercus prinus)* collected at Rockville, Pa., by the author. Six other reared specimens at hand.

ROMALEUM CYLINDRICUM n.sp.—Resembling *R. atomarium* Drury in form and size; brunneus, clothed above and below with cinereous pubescence. Eyes coarsely granulate, more widely separated on vertex than *atomarium*, lobe extending above antenna relatively narrower, antenna stout, scape clavate, second joint short, third longer than first two taken together, fourth shorter than third, fifth to ninth of about equal length, last two missing.

Thorax wider than long, very convex, narrower at base than at apex, sides rounded, surface irregularly finely punctuate; slightly raised laterally making an irregularly shaped area in

*Chas. Schaeffer—Jour. N. Y. Ent. Soc., Vol. 12, p. 209, 1904.

†F. C. Craighead—Dom. of Canada Department of Agriculture Technical Bulletin 27, page 69, 1923.

central portion, depression in front of scutellum. Scutellum triangular. Elytra slightly wider than thorax at widest point, much wider than thorax at base, sides parallel, gradually rounded in posterior third, apices truncate, bispinose. Abdomen finely punctured, last ventral broadly rounded, prosternum one-third width of front coxa, between front coxae; much wider in proportion than in *atomarium*. Length 20 mm., width 6 mm.

Type labeled Paradise Arizona, H. H. Kimball collector, in collection of the author. The author is indebted to Mr. A. B. Champlain for the specimen.

ELAPHIDION (ANOPLIUM) DUNCANI n.sp.—Robust, cylindrical, clothed with recumbent cinereous hairs. Eyes coarsely granulate, antenna reaching to beyond middle of elytra, without spines, scape thick, clavate, second to fifth joints inclusive campanulate, sixth to eleventh flattened, second short, third longer than fourth, fourth shorter than fifth, fifth to eleventh of about equal length, eleventh shorter than tenth.

Thorax longer than broad, cylindrical, slightly constricted at base, a slight lateral and basal swelling each side, disk irregularly punctured and tuberculate, brunneus hairs longer than recumbent cinereous pubescence, arising from each tubercle, or arising at the base of the tubercle, median line smooth. Scutellum rounded, densely pubescent. Elytra wider than thorax, sides parallel, truncately rounded, devoid of spines, disk irregularly punctured, punctures becoming sparse and of smaller size toward apex, a brunneus hair longer than recumbent cinereous pubescence arising from each puncture; many of the basal punctures with small tubercles. Ventral surface shining, appressed cinereous pubescence arising from densely placed minute punctures, longer brunneus hairs arising from large sparsely placed punctures. Legs stout, first posterior tarsal joint longer than two following joints taken together. Length 16 mm., width 4 mm.

Type a female collected at Globe, Arizona, by Mr. D. K. Duncan, in author's collection. The species is named for the collector, who kindly gave me permission to retain the specimen.

The author is indebted to Mr. W. S. Fisher for kindly comparing the specimen with the Casey collection and the North American material in the National Museum collection. Also to Prof. H. C. Fall, who compared it with his material.

PHYSOCNEMUM ANDREAE Hald. Was found breeding in

dead cypress *(Taxodium distichum)* trees which had been killed by the encroaching sand dunes, at Cape Henry, Virginia. Trees up to two feet in diameter had been infested. The larvae make irregular galleries between the bark and the sapwood, excavating part of each as they travel. These mines are often two feet in length and are tightly packed with granular frass. When the larva is mature it enters the sapwood and prepares a pupal cell. The upper end of the cell leads to the bark and is tightly packed with granular frass. The adult in emerging has merely to clear away the frass and gnaw a hole through the thin bark. Pupal cells were found on September 27th.

A New Species of Holcocera Predaceous on Mealybugs. (Micro-lepidoptera).

By ANNETTE F. BRAUN, Cincinnati, Ohio.

Holcocera phenacocci n. sp.

Labial palpi gray, tip of second segment white, third segment a little over half the length of the second; basal segment of antenna rather slender, pecten grayish white. Head and thorax gray. Scales of the fore wings whitish, minutely blackish-tipped, so that the general color effect is gray; amongst these minutely tipped scales are scattered deeply black-tipped scales; the latter become more numerous toward the apex and form a rather clearly defined black line around the extreme tip of the wing; all other marks obsolete. Cilia pale gray, marked with paler whitish lines around the apex. Hind wings paler than the fore wings, cilia whitish, with a faintly fulvous tinge. Legs gray, tarsal segments white-tipped. Expanse: 11 mm.

Type (♀), Avalon, Catalina Island, California, August, 1926, received from Prof. T. D. A. Cockerell, who writes that on opening a box containing specimens of the mealybug, *Phenacoccus colemani* Ehrhorn, the moth flew out. It may reasonably be inferred that the larva is predaceous on the *Phenacoccus.*

A male in the writer's collection from Alameda County, California, rather doubtfully associated with this species, has the basal segment of the antenna excised, and the upper of the pair of spots usually present at the end of the cell in this genus, distinct.

ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., APRIL, 1927.

The Situation of Systematic Entomology.

At the Third International Congress of Entomologists at Zürich, in July, 1925. Dr. Walther Horn, of Berlin, read a paper on the distressing situation of systematic entomology with especial reference to conditions in Germany and some proposals for reform. The immediate incitement to this essay was the question frequently put to him: Why has the situation become so difficult in recent years? A very brief resumé of his answers may be of interest outside of the country of which he particularly spoke. He writes:

Some believe that they can adduce many causes which should bear the blame—the decline of power on the part of many to devote time and money to entomological purposes and which has often compelled the sale of their collections and libraries; the difficulties of the modern dwelling problem; the greater need of a pecuniary return for work done; a certain withdrawal of interest from scientific activities to richer fields; the inclination to sport and, last not least, the collecting of postage stamps and much more of the same sort. I willingly grant that the stone is rolling more quickly by reason of these circumstances, but I do not believe that any one of them is primarily responsible for the conditions. . . . The two primary factors which have caused the relative regression of systematic entomology in Germany and in the largest part of the rest of the world and which, if a reformation does not take place, will irresistibly do more, are, in my opinion, 1. The fact that systematic entomology rested for the most part on the shoulders of amateurs, who bore the load so long until systematics has become so gigantic that it is impossible for this burden to be carried by those who can be active in it only as an avocation

through their love of the subject. . . . 2. The entire modern trend of zoology which, in Germany, partly unconsciously, partly automatically, has separated itself more and more from taxonomy to attack the great biological sciences with their vast complexes of problems.

He discusses the amateurs, the descriptive entomologists of this group, the museums, the academies, the universities, applied entomology, the scientific publishing facilities and bibliography as affecting systematic entomology, concluding with "twelve theses for the reform of entomology in Germany." One result was the resolutions adopted by the Congress published in the NEWS for March, 1926, pages 92-93. Another was the action taken by the Deutsches Entomologisches Institut., as stated in the NEWS for March of this year, page 77.

Announcement of an Experiment.

Dr. Wm. M. Wheeler in his "Social Life Among the Insects" says in substance: We think it a wonderful thing that a wasp of a certain species will select a caterpillar or spider of a certain species, never varying, sting it, store it away and lay an egg on it. Why always the same species of game for a certain species of wasp? Dr. Wheeler points out that we take up the life cycle at the wrong place. Start with the egg. It hatches on a certain species of caterpillar. The grub eats the caterpillar and the smell and taste are firmly implanted in its memory. The grub metamorphoses into a wasp, but the nervous system does not undergo radical change. The wasp probably remembers the smell and taste of the grub it ate and searches until it finds another that answers the same description upon which to lay her egg. The particular species of caterpillar is not vital to the wasp since the egg can be removed and placed on a caterpillar of another species and does very well.

To carry Dr. Wheeler's thought one step further:

Let us transfer eggs laid by various wasps on specific caterpillars or spiders to different game, raise the wasp in each case and then give her the choice between the two species of game: The one she was raised on and the one her mother was raised on. If she selects the species she was raised on and

ignores the one her mother selected it is proven that memory lasts through the metamorphosis to a startling degree. This point is a very interesting one academically. The nearest experiment I have heard of was on food plants of Lepidoptera and I have no further literature on the point.

The practical application of this experiment which might well prove of great economic value would be this:

Transfer eggs of wasps laid on harmless or at least not economically harmful caterpillars or spiders to caterpillars that do enormous crop damage and "train" the wasps to search out these caterpillars. The food supply is there if only we can make the wasp overcome its memory of the food of its forefathers by substituting memory of the pest we want destroyed.

Dr. Paul Gilmer of the U. S. Biological Laboratory at Wichita now working on the apple-destroying coddling moth has kindly offered to share his equipment with me this Summer to attempt to carry out this experiment.

This is published in hopes that others may apply this principle to other pests. An attempt elsewhere might succeed when conditions here might prevent success.

CHAPMAN GRANT, Major, U. S. Infantry.

Entomological Literature

COMPILED BY E. T. CRESSON, JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

Papers of systematic nature will be found in the paragraph beginning with (N). Those pertaining to Neotropical species only will be found in paragraphs beginning with (S). Those containing descriptions of new forms are preceded by an *.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

Papers published in the Entomological News are not listed.

4—Canadian Ent., Guelph. **10**—Proc., Ent. Soc., Washington. **11**—Deutsche Ent. Zeitschrift, Berlin. **12**—Jour. of Economic Ent. **14**—Ent. Zeitschrift, Frankfurt a. M. **17**—Ent. Rundschau, Stuttgart. **18**—Intern. Ent. Zeitschrift, Guben. **21**—The Entomologist's Record, London. **24**—Ann. Soc. Ent. France. **25**—Bull. Soc. Ent. France.

27—Boll. Soc. Ent. Italiana. 33—Bull. et An., Soc. Ent. Belgique. 39—The Florida Entomologist. 41—Bull. Soc. Ent. Suisse. 45—Zeit. f. Wissenschfl. Insektenbiol., Berlin. 51—Notulae Ent., Helsingfors. 59—Encyclopedie Entomologie, Paris. 69—Comptes R., Acad. Sci. Paris. 77—Comptes R., Soc. Biologie, Paris. 107—Biologisches Zentralblatt. 113—Jour. Agric. Research, Washington. 114—Ann-Epiphyties, Paris. 125—Verhandl. Zool.-Bot. Ges., Wien. 127—Archiv f. Entwickl. der Organis., Berlin. 130—Ohio Jour. Sciences, Columbus. 131—Ent. Blätter, Berlin. 133—Jour. Experimental Zool. 141—Amer. Naturalist. 151—Oc. Pap. Boston Soc. Nat. Hist. 154—Zool. Anzeiger, Leipzig.

GENERAL.—Bethune-Baker, G. T.—Note on Dr. Verity's method of nomenclature. A sub-species, a race, a local form or a form! What are they? (**21**, xxxix, p. 10-11.) **Bremer, H.**—Ueber die tagezeitliche konstanz in schlüpftermine der imagines einiger insekten und ihre experimentelle beeinflussbarkeit. (**45**, xxi, p. 209-216.) **Case, E. C.**—Environment of tetrapod life in the late paleozoic of regions other than North America. (Carnegie Inst. Pub., No. 375, 211 pp., ill.) **Caullery, M.**—L'histoire des fourmis de Réaumur. (Revue Sci., Paris, lxv, p. 65-70, ill.) **Chamberlin, W. J.**—The army of silent tree killers. (Am. Forest. & Forest Life, Mar. 1927, p. 141-144, ill.) **Ferrière, C.**—La phorésie chez les insectes. (**41**, xiii, p. 489-496.) **Gibson, A.**—International entomology—retrospective and prospective. (**12**, xx, p. 47-62.) **Grassi, B.**—Commemorazione. (Atti dei Lincei. Mem. Cl. Sc. Fis., ii, p. xix-lxiii, port.) **Graves, P. P.**—Species, subspecies and race. (**21**, xxxix, p. 22-25.) **Greer, T.**—Nomenclature. (**21**, xxxix, p. 28-29.) **Haeckel, E.**—Dr. Roger Verity and nomenclature. (**21**, xxxix, p. 29-30.) **Howard, L. D.**—The needs of medical entomology. (**141**, lxi, p. 173-179.) **Manter, J. A.**—Charts and forms as aids in teaching economic entomology. (**12**, xx, p. 76-79.) **Nagel, P.**—Das rätsel der "trilobitenlarve." (**131**, xxii, p. 173-179, ill.) **Robinson, W.**—Water binding capacity of colloids a definite factor in winter hardiness of insects. (**12**, xx, p. 80-88, ill.) **Rogers, W. H.**—Lycaenidae and ants. (Vict. Nat., Melbourne, xliii, p. 276.) **Sibley et al.**—A preliminary biological survey of the Lloyd-Cornell reservation. Insect and some other invertebrates. (Bull. Lloyd Libr., No. 27, p. 87-247, ill.) **Tams, W. H. T.**—The classification of varieties and the application of the terms in present use.

(**21,** xxxix, p. 25-26.) **Tillyard, R. J.**—The principles of biological control in economic entomology. (Nature, cxix, p. 202-205.) **Trouvelot, B.**—Recherches de biologie appliquée sur la teigne des pommes de terre & ses parasites. . . Étude des conditions de pullation des insectes. (**114,** x, p. 1-132, ill., 1924.) **Turner, H. J.**—Notes on nomenclature. (**21,** xxxix, p. 11.) **Turner, H. J.**—Nomenclature. (**21,** xxxix, p. 30.) **Warren, B. C. S.**—Suggestions on nomenclature. (**21,** xxxix, p. 20-22.) **Wheeler, G.**—Note on varietal nomenclature. (**21,** xxxix, p. 27-28.) **Wightman, A. J.**—Notes on nomenclature. (**21,** xxxix, p. 26-27.)

ANATOMY, PHYSIOLOGY, ETC.—Agar, W. E.—The regulation of behaviour in water-mites and some other arthropods. (Jour. Comp. Psych., vii, p. 39-74.) **Campbell, F. L.**—Notes on silkworm nutrition. (**12,** xx, p. 88-90.) **Dubois, R.**—La torpeur nymphale et l'autonarcose carbonique. A propos d'une note de P. Portier et de Mille de Rorthays sur "La composition chemique de l'atmosphère interne des cocons de Bombyx mori." (**77,** xcvi, p. 263-265.) **Handlirsch, A.**—Handbuch der zoologie. Insecta. Bd. 4, Lief. 4, p. 403-448, ill. **Harrison, J. W. H.**—Experiments on the egg-laying instincts of the sawfly, Pontania salicis, and their bearing on the inheritance of acquired characters, . . . (Proc. Roy. Soc., London, Biol. Sci., (B), ci, p. 115-126.) **Huxley, J. S.**—Discontinuous variation and heterogony in Forficula. (Jour. Genet., London, xvii, p. 309-327, ill.) **Lévy, R.**—Intoxication de l'ecrevisse par les venins de deux myriapodes chilopodes. Lithobius forficatus et Cryptops anomalans, p. 256-257. Action antitoxique du sang de Lithobius forficatus vis-a-vis du venin de la même espéce et vis-a-vis du venin de Cryptops anomalans, p. 258-259. (**77,** xcvi.) **Mavor, J. W.**—A comparison of the susceptibility to X-rays of Drosophila melanogaster at various stages of its life-cycle. (**133,** xlvii, p. 63-83.) **Mohr, O. L.**—The second chromosome recessive hook bristles in Drosophila melanogaster. (Hereditas, Lund, ix, p. 169-179.) **Rostand, J.**—Sur la greffe céphalique chez les insectes. (**25,** 1926, p. 237-238.) **Smirnov u. Zhelochovtsev.**—Einwirkung der nahrungsmenge auf die merkmale von Drosophila funebris. (**154,** lxx, p. 58-64, ill.) **Teodoro, G.**—Un metodo rapido e semplice per mettere in evidenza il secreto serico nel dotto escretore del seritterio. (**27,** lix, 2-4, ill.) **Timoféeff-Ressovsky, H. A. u. N. W.**—Genetische analyse einer freilebenden Drosophila melanogaster population. (**127,** cix,

p. 70-109, ill.) **Vignon, P.**—Sur la nervation primitive de l'aile des insectes et sur les changements que les orthoptères ont apportés au plan originel. (**69**, clxxxiv, p. 234-236, ill.) **Weber, H.**—Das problem der gliederung des insektenthorax. Die stigmenstellung. (**154**, lxix, p. 311-332, ill.) **Weed, A.**—Metamorphosis and Reproduction in apterous forms of Myzus persicae, as influenced by temperature and humidity. (**12**, xx, p. 150-157, ill.)

ARACHNIDA AND MYRIOPODA.—Baerg, W. J.—Tarantulas as pets. (Nature Mag., Mar. 1927, p. 173-176, ill.) **Brazil e Vellard.**—Contribuicao ao estudo do veneno das aranhas, 2d Mem. (Mem. Inst. Butántan, Sao Paulo, iii, p. 243-299, ill.) **Emerton, J. H.**—Spiders. (Bull. Boston Soc. Nat. Hist. no. 42, p. 3-8, ill.) **Giltay, L.**—La métamérisation du sternum des araignées. (**33**, lxvi, p. 322-324, ill.) **Hiley, H. H.**—Development of the male gonopods and life history studies of a polydesmid millipede. (**130**, xxvii, p. 25-43, ill.) **Kastner, A.**—Der bau des weberknechtes. (Mikro. für Naturf., Berlin, v, p. 41-44, ill.)

THE SMALLER ORDERS OF INSECTA.—Klingstedt, H.—Beobachtungen über die biologie, insbesondere das eierlegen von Limnophilus decipiens (Trich.) (**51**, vi, p. 118-120.) **Vignon, P.**—Sur les origines ancestrales des libellules. (**69**, clxxxiv, p. 301-303, ill.)

(N) ***Ewing, H. E.**—Descriptions of new gen. and sps. of Mallophaga, together with keys to some related genera of Menoponidae and Philopteridae. (Jour. Wash. Ac. Sc., xvii, p. 86-96.) ***McDunnough, J.**—A new Ephemerella from Illinois (Ephemeroptera). (**4**, lix, p. 10.) ***Needham, J. G.**—A baetine mayfly nymph with tusked mandibles. (**4**, lix, p. 44-47 ill.) ***Watson, J. R.**—New Thysanoptera from Florida. (**39**, x, p. 60-62.)

(S) ***Navas, R. P. L.**—Neue insekten (Neuropt.). (**11**, 1926, p. 428-431, ill.) ***Watson, J. R.**—A new Liothrips from Santo Domingo. (**39**, x. p. 59-60.)

ORTHOPTERA.—Chopard, L.—Sur l'existence de tympans fémoraux chez certains Gryliides. (**25**, 1926, p. 202, ill.) **Hood, J. D.**—Gryllus domesticus, as a household pest in Rochester, N. Y. (Gryllidae). (**10**, xxix, p. 22-23.)

HEMIPTERA.—Ekblom, T.—Morphological and biological studies of the Swedish families of Hemiptera-Heteroptera. (Zool. Bidrag, Uppsala, x, p. 31-179, ill.)

Knight, H. H.—Notes on the distribution and host plants of some North American Miridae. (**4,** lix, p. 34-44.) **Mallach, N.**—Bemerkungen zur lebensweise von Aphelocheirus montandoni (Naucor.). (**11,** 1926, p. 426-427, ill.) **Snodgrass, R. E.**—The head and mouth parts of the Cicada. (**10,** xxix, p. 1-16, ill.)

(N) ***Beamer, R. H.**—New species of Erythroneura (Cicadellidae). (**4,** lix, p. 30-31.) **Hottes, F. C.**—A note concerning the date of publication of two aphid genera. (Proc. Biol. Soc. Wash., xl, p. 47-48.) ***Knight, H. H.**—Descriptions of twelve n. sps. of Miridae from the Dist. of Columbia and vicinity. (Proc. Biol. Soc. Wash., xl, p. 9-18.) **Morrison, H.**—An apparently new sugar-cane mealybug. (**113,** xxxiii, 757-759 pp., ill.) **Tissot, A. N.**—The identity of the new citrus aphid, Aphis spiraecola. (**39,** x, p. 56-57.) **Vayssière, P.**—Contribution a l'étude biologique et systematique des Coccidae. (**114,** xii, p. 197-382, ill.)

(S) ***Larrousse, F.**—Etude biologique et systematique du genre Rhodnius (Reduvidae). (Ann. de Parasitalogie Hum. et Comp., v, p. 63-88, ill.)

LEPIDOPTERA.—Crowell, M. F.—The European corn borer. The relation of the larvæ to submergence. (New Ham. Agric. Expe. Sta. Techn. Bull. 30, 19 pp., ill.) **Goldschmidt u. Fischer.** Erblicher gynandromorphismus bei schmetterlingen. (**127,** cix, p. 1-13, ill.) **Goldschmidt u. Katsuki.** Erblicher gynandromorphismus und somatische mosaikbildung bei Bombyx mori. (**107,** xlvii, p. 45-54, ill.) **Harrison, J. W. H.**—Melanism in the lepidoptera and its evolutionary significance. (Nature, London, cxix, p. 318.) **Hayward, K. J.**—Miscellaneous notes from Argentina. (**21,** xxxix, p. 18-20.) **MacAndrews, A. H.**—Biological notes on Zeiraphera fortunana and Ratzeburgiana (Eucosmidae). (**4,** lix, p. 27-29.) **Muller-Rutz, J.**—Weitere genitaluntersuchungen an kleinschmetterlingen. (**41,** xiii, p. 477-479.) **Reub, T.**—Ueber funktion der Sexualarmaturen bei lepidopteren (Rhop.) und die resultierende weiterentwicklung meines versuchten natürlichen systems der Dryadinae. (**11,** 1926, p. 431-440, ill.) **Stearns, L. A.**—The hibernation quarters of Laspeyresia molesta. (**12,** xx, p. 185-190, ill.) **Strand, E.**—Catalogue des microlépidoptères, que j'ai decrits jusqu'a l'année 1926. (**18,** xx, p. 371.) **Strand, E.**—Liste des rhopaloceres et grypoceres exotiques décrits dans

mes travaux jusqu'en 1926. (Bul. Soc. Zool., France, li, p. 397-418.) **Völker, U.**—Mitteilungen ueber das aufsuchen der raupen von für die jenaer kalkberge charakteristischen noctuiden. (**18,** xx, p. 378-384.)

(N) ***Barnes & Benjamin.**—Notes and new species. (**4,** lix, p. 4-10.) ***Bottimer, L. J.**—Notes on some lepidoptera from eastern Texas. (Jour. Agric. Res. xxxiii, p. 797-819, ill.) **Die Gross-Schmetterlinge der Erde.**—Fauna Americana. Lief. 179, 180. Vol. vii, p. 181-204. Von M. Draudt. ***McDunnough, J.**—Two new Canadian tortricids. (**4,** lix, p. 33-34, ill.)

(S) ***Boy, H. C.**—Eine neue Agrias-form. (**18,** xx, p. 344.) ***Pic, M.**—Trois hétéromères nouveaux. (**25,** 1926, p. 203-204.) **Schade, F.**—Entomologische skizzen aus Paraguay. Ceratocampiden. (**17,** xliv, p. 4.) ***Stichel, H.**—Vorarbeiten zu einer Revision der Riodinidae (Erycinidae). (**11,** 1926, p. 385-400.)

DIPTERA.—Chittenden. F. H.—Tritoxa flexa, the black onion fly (Ortalidae). (**4,** lix, p. 1-4, ill.) **Curran, C. H.**—Note on the identity of Conops brachyrhynchus. (**4,** lix, p. 32.) **Greene, C. T.**—The larva and puparium of Oedematocera dampfi. (**10,** xxix, p. 18-19, ill.) **Jancke, O.**—Ueber die brutpflege einiger thalakostraken. (Arch. f. Hydrob., Stuttgart, xvii, p. 678-698, ill.) **Johnson, C. W.**—The infestation of bluebirds' nests by Protocalliphora. (Bull. Northeast. Bird-Band Assoc. iii, p. 1-3.) **Lundblad, O.** Zur kenntnis der flöhe. (**154,** lxx, p. 7-26, ill.) **O'Kane, W. C.**—Black flies in New Hampshire. (New Ham. Agric. Exper. Sta. Tech. Bull. 32, 23 pp., ill.) **Mercier et Villeneuve.**—Les muscles gubernateurs de la lunule chez Eristalis tenax. Dimorphisme sexual. (**69,** clxxxiv, p. 299-301, ill.) **Pavlovskij, E.**—Zur vergleichenden anatomie des männlichen geschlechtsapparats der flöhe. [in Russian] (Revue Russe Ent. xx, p. 5-15, ill.) **Rogers, J. S.**—Notes on the biology of Atarba picticornis. (Tipulidae.) (**39,** x, p. 49-52, ill.) **Roubaud et Colas-Belcour.**—Action des diastases dans le determinisme d'eclosion de l'oeuf chez le moustiques de la fièvre jaune (Stegomyia fasciata). (**69,** clxxxiv, p. 248-249.)

(N) **Aldrich, J. M.**—Notes on the dixiid genera Cordyligaster and Eucordyligaster. (Jour. Wash. Ac. Sci., xvii, p. 84-86.) ***Alexander, C. P.**—The crane-flies (Tipulidae) of New England: Second Supplementary list. (**151,** v, 223-231 pp.) ***Curran, C. H.**—The species of the Tachinid

genera related to Lydella, as represented in the Canadian national collection. (4, lix, p. 11-25.) ***Curran, C. H.**—A new species of Mallochiella (Milichiidae). (4, lix, p. 49-50.) **Shannon, R. C.**—Notes on and descriptions of syrphid-flies of the subfamily Cerioidinae. (Jour. Wash. Ac. Aci., xvii, p. 38-53.) **Twinn, C. R.**—Mosquitoes from Baffin Land. (4, lix, p. 47-49, ill.)

(S) ***Aldrich, J. M.**—A new species of Oedematocera reared from the tropical migratory locust. (10, xxix, p. 17-18.) ***Hermann, F.**—Beitrag zur kenntnis der Asiliden. Der verwandtschaftskreis des gen. Holcocephala. (125, lxxiv and lxxv, p. 153-191, ill.)

COLEOPTERA.—Bott, R.—Die lebensgeschichte von Gyrinus natator. (18, xx, p. 361-367, ill.) **Kolbe, H.**—Zur morphologie der arten von Cerapterus, einer gattung der coleopterenfamilie des Paussiden. (11, 1926, p. 369-384.) **Lesne, P.**—Quelques particularités biologiques des Gastroidea (Chrysomelidae). (59, (B) Col. ii, p. 95-96.) **Plavilstshikov, N. N.**—Addenda et corrigenda concernant le Coleopterorum Catalogus, parties 73 et 74 (Lamiinæ). (59, (B) Col. ii, p. 49-68.) **Urban, C.**—Ueber die Olibruslarve (Phalacr.) (11, 1926, p. 401-412, ill.)

(N) **Heller, K. M.**—Bestimmungsschlüssel aussereuropäischer käfer: Calandrini spurii (Laogenia etc.) und verwandte. (131, xxii, p. 180-187, ill.) ***Horn, W.**—Ueber die cicindelinen vom mexikanischen californien: Ueber den ersten cicindelen-bastard: Ueber historische exemplare der Motschulsky'schen sammlung. (131, xxii, p. 169-173.) **Kleine, R.**—Bestimmungstabelle der Brenthidae. (14, xxxx, p. 341-344.)

(S) ***Fisher, W. S.**—A new cerambycid beetle from Colombia and Central America. (10, xxix, p. 23-24.)

HYMENOPTERA.—Brocher, F.—Observations sur le Perithous mediator. Etude anatomique de la tarière, de ses muscles et de son fonctionnement. (24, xcv, p. 391-410, ill.) **Compere & Smith.** Notes on the life-history of two oriental chalcidiid parasites of Chrysomphalus. (Univ. Cal. Pub. Ent., iv, p. 63-73, ill.) **Frison, T. H.**—The distribution of Bremus kincaidii. (Bremidae). (4, lix, p. 32.) **Hayes, W. P.**—Another host of Pristocera armifera (Bethylidae.) (10, xxix, p. 20-22.) **Voukassovitch, P.**—Observations biologiques sur la Macrocentrus abdominalis, braconide parasite. (77, xcvi, p. 379-381.)

OBITUARY.

I have received a letter from Mrs. Bezzi, announcing the death of her husband, Professor MARIO BEZZI, which occurred suddenly on January 14, 1927. He was about 59 years old. This is a great loss to Dipterology, especially as in his new position he expected to be able to do more than ever on the subject. J. M. ALDRICH, United States National Museum.

The *Journal of the New York Entomological Society* for December, 1926, contains an announcement of the death of Mrs. ANNIE TRUMBULL SLOSSON, on October 4, 1926, at her home, 26 Gramercy Park, New York City, followed by an appreciation of her work, entomological and otherwise, by William T. Davis. If Dr. Henry Skinner were alive, he, better than anyone else connected with the NEWS, could have expressed our regrets at the passing of Mrs. Slosson, just as he paid tribute to her living as "A Loved and Respected Entomologist," in our number for December, 1919. But Dr. Skinner crossed over before Mrs. Slosson and it devolves upon us to say that we too were helped by her collections and the free use of her material and were cheered and amused by her breezy letters. Here are a few sentences from one dated "February 28, '21," after a long gap in our correspondence: "I recognized the old familiar handwriting at once! I am very well now—for an old woman. Alas, my one *dilatatus* is of the inferior sex, a male, poor thing. And it is labelled simply 'Florida.' But I think you may be right about its being taken at S[uwanee] Springs, for I usually labelled my Ch[arlotte] Harbor finds more definitely. We shall never know! It is good to hear from you again. .....has gone and got engaged, infant that he seems to me. You will be surprised to hear that his choice is the 'loveliest creature ever made.' Ah, what it is to be young and have dreams."

It so happens that the same number of the *Journal* (page 370) mentions the receipt by the American Museum of Natural History of Mrs. Slosson's collection about November, 1925.

P. P. CALVERT.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Wanted—Bembidion (Coleoptera, Carabidae) from South America, Africa, Australia, India. Will buy or exchange for North American Species. Howard Notman, 136 Joralemon St., Brooklyn, N. Y., U. S. A.

Pselaphidae desired from all parts of N. A. for study. Will determine for privilege of study or pay cash. Am monographing family. F. C. Fletcher, Dept. of Entomology, Cornell University, Ithaca, N. Y.

Buprestidae—I am making a revisional study of the North American Agrilus, and will be glad to examine any material in this genus collected north of Mexico. W. S. Fisher, U. S. National Museum, Washington, D. C.

Chrysomelidae—Desire to exchange coleoptera, especially in family Chrysomelidae. Send me your offerta in this family and your desiderata in coleoptera. Paul N. Musgrave, 601 Walnut Ave., Fairmont, W. Va.

Wanted—Cicindelidae & Cerambycidae in exchange for local coleoptera. Address Ernest Baylis, 5011 Saul Street, Philadelphia, Pa.

Buprestidae of the world and N. A. Carabidae and Rhynchophora wanted in exchange for other Coleoptera. Will buy rare species. Alan S. Nicolay, 198 Fernwood Ave., Upper Montclair, N. J.

For Exchange.—Cocoons of Actias luna, and Automeris io and Datana ministra and angusii and pupae of Papilio asterias; also coleoptera of China. Mrs. Robert Milde, Lewiston, Minnesota.

Wanted for Cash—Living pupae of P. ajax, cresphontes, rutulus, zolicaon, eurpmedon, Amph. nessus, Sph. abbottii, Ph. achemon pandorus, Sph. Kalmiae, drupiferarum, Smer. cerisyi, Sam. gloveri, californica, etc. Send offer with prices to Max Rothke, 1841 E. Elm Street, Scranton, Pa.

Tropical Lepidoptera—A large variety to exchange for rare North American butterflies. Send for price-list. Hal Newcomb, Box 135, Highland Park Sta., Los Angeles, Calif.

Wanted—Coleoptera. I wish to purchase correctly named Coleoptera, from North America and Canada. Please send lists. Edwin E. Calder, R. I. College of Pharmacy, 235 Benefit St., Providence, R. I.

Wanted—Names and addresses of collectors of Lepidoptera in southern states, and in all foreign countries. Collectors communicate—Mrs. Elmer Grubb, R. D. No. 1, Fredericktown, Ohio.

Exchange—Columbian butterflies by 100 monthly arrivals, also N. A. pupae and cocoons. Mrs. Emma Kessler, 2 Hylan Blvd., Rosebank, Staten Island, New York.

IN PRESS

CATALOGUE No. 23

Books on Insects of Medical Interest

Diptera; Siphonaptera; Mallophaga;
Acarina; Ixodoidea

including the library of

W. D. HUNTER

and

BOOKS ON COLEOPTERA

including the libraries of

F. C. BOWDITCH, L. PERINGUEY and
H. W. WENZEL

ALSO GENERAL WORKS AND SERIALS

JOHN D. SHERMAN, Jr.
132 Primrose Avenue
Mount Vernon New York

FROHAWK'S BRITISH BUTTERFLIES, two vols., (new), recently published at $30.00, price $12.00 and postage. The colored plates, illustrating the complete life-history of every British species, are the finest ever issued. Transactions of London Entomological Society containing important articles on research work in all parts of the world at one-fourth cost and postage. Other important works. 250,000 British Lepidoptera and Coleoptera. Particulars from

A. FORD, 42, IRVING ROAD, BOURNEMOUTH, HANTS., ENGLAND.

BUYING and Selling of Eggs, Larvae, Pupae, Cocoons, Life Histories of Insects, Butterflies and Beetles.

A. TROSCHEL,
3210 Seminary Avenue, Chicago, Illinois.
SEND YOUR LIST.

ABERRATIONS OF BUTTERFLIES WANTED

WHEN SELLING A BUTTERFLY COLLECTION, IT IS ADVANTAGEOUS TO DISPOSE OF THESE ODDITIES SEPARATELY. THEY BRING GOOD MONEY. SEND ME A DESCRIPTION OR BETTER STILL, A SIMPLE PENCIL SKETCH OF YOUR SPECIMENS.

JEANE D. GUNDER, PASADENA, CAL.

Rare Lepidoptera of the Southwest.

Strymon *polingi*, B. & Benj. (paratypes), per pair . $5.00
Coloradia *davisi*, " " " " ♂♂ $5.00 to 10.00
Coloradia *davisi*, " " " " ♀♀ 15.00 to 25.00
and others.

O. C. POLING, Box 277, Laguna Beach, California.

NATAL Butterflies, Moths and Beetles for sale. Mantis and Stick Insects.

Sphingidae a specialty. Apply to the breeder,

G. F. Leigh, 463 West Street, Durban, Natal, S. Africa.

Fertile ova of *C. regalis*, *E. imperialis*, *M. modesta*, *A. luna*, *A. io*, *Sphinx jamaicensis*, in June and July.

50 eggs $1.00, cash with order.

No order for less than 50 eggs accepted.

A. J. POTTER, East Killingly, Conn.

NEW ARRIVALS

From Colombia, South America:

OVER 10,000 BUTTERFLIES, INCLUDING

Morpho cypris
" sulkowskyi
Morpho amathonte
Caligo spp.

From Cuba:

1500 BUTTERFLIES AND MOTHS, INCLUDING

Papilio columbus
" andraemon
" celadon
" devilliersi
Urania boisduvali
Erinyis guttalaris
Protoparce brontes, etc.

From Venezuela:

Over 5000 Lepidoptera
200 Dynastes hercules

From New Guinea

2000 Coleoptera
200 Orthoptera

From Assam, India:

1200 BUTTERFLIES AND MOTHS, INCLUDING

Papilio arcturus
" philoxenus
Kallima inachis
Brahmaea wallachi

And Many Other Showy Species

From Tibet (Bhutan):

Armandia iidderdalii
Parnassius hardwicki

CATALOGUES OF
ENTOMOLOGICAL SUPPLIES AND SPECIMENS
ON APPLICATION

If interested kindly send your list
of desiderata for further information to

THE KNY-SCHEERER CORPORATION OF AMERICA

Department of Natural Science
G. Lagai, Ph.D.

New York
56-58 West 23d Street